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Abstract

Background

Few studies have examined the potential of linked administrative data for research on child health. This analysis describes the application of a non-categorical survey-based tool, the Children with Special Health Care Needs (CSHCN) Screener, to administrative data.

Data and methods

Five Screener items were applied to data from Population Data British Columbia. Hospital admissions and demographic and community characteristics of a cohort of children aged 6 to 10 in 2006 were examined to validate the use of these items.

Results

Overall, 17.5% of children were identified as CSHCN. An estimated 14% of children used more medical care and 5.2% had more functional limitations than is usual for children of the same age; 3.3% were prescribed long-term medication; 1.9% needed/received treatment or counselling; and 0.1% needed/received special therapy. Boys were more likely than girls to be identified as CSHCN.

Interpretation

With some limitations, the CSHCN Screener can be applied to Canadian administrative health data.

Keywords

Child health services, children with disabilities, data linkage, medical record linkage

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The increasing availability of provincial and national linked data has created opportunities to conduct health research using administrative information. Studies of children that used such data have largely focused on health service utilization or on the prevalence of specific conditions.[1-3] However, categorical approaches based on specific conditions do not include the large numbers of rare conditions that have similar consequences, nor do they include children with undiagnosed conditions. Moreover, policies, programs, and interventions generally do not target specific conditions.

An alternative conceptual framework offers a non-condition-specific or "non-categorical" approach to identifying children with chronic illness.[4] In this framework, children can be grouped together by virtue of similar consequences of diverse conditions.[5] This non-condition-specific approach is particularly useful for program planning, service delivery, and policy development,[6-8] where decisions must be made on the basis of health consequences for large groups or populations.

Neff et al.[9-11] used medical claims and hospital discharge data to study children with chronic conditions over time. A unique feature of their research is that, despite the use of a categorical or specific clinical condition as input, the resulting conceptualization of children with health care needs incorporates medical complexity with a focus on consequences (non-condition-specific). Their findings suggest that, although administrative data typically pertain to services and diagnoses (condition-specific), research using non-condition-specific approaches may be possible.

The present study examines the feasibility and limitations of applying a non-categorical approach (focused on service utilization rather than on specific diagnoses) to administrative data in order to identify children with health problems. The widely used Children with Special Health Care Needs (CSHCN) Screener is one of the few established measures of child health that employs a non-categorical approach. The Screener is a validated, non-condition-specific, consequence-based tool used to identify children with health problems[5,12-14] as reflected in the use of health services, devices, and medications. However, the Screener is survey-based and has not been applied to administrative data.

With information made available by Population Data British Columbia, this article explores the opportunities and limitations of applying the CSHCN Screener to linked administrative data.

Data and methods

Data

The analysis is based on four separate administrative data holdings of Population Data British Columbia (PopData):

- The *Medical Services Plan (MSP) Payment Information File*: medical services provided by fee-for-service practitioners to people covered by British Columbia's universal health insurance program from 1985 to the present.[15,16]
- The *Discharge Abstract Database (DAD)*[17]: hospital discharges, transfers, and in-hospital deaths of patients from all acute-care hospitals from 1985 to the present.
- *PharmaNet*[18]: prescription data for drugs and medical supplies (for example, insulin pumps, orthotics) dispensed by pharmacies.
- The *Consolidation File* (MSP Registration and Premium Billing): population demographic data prepared for research use by PopData.

All PopData data are linked using encrypted randomly assigned identifiers that match individual personal health numbers, and thereby provide individual-level data that maintain anonymity and confidentiality.

This analysis is part of a longitudinal study of the health of caregivers of children with health problems. The sample of children (N = 232,870) was based on the most recent data available when access was requested (March, 2008). This study imposed the CSHCN Screener criterion that a health condition must have lasted or be expected to last for at least 12 months. The analysis used 2006 data (January 1 to December 31) for children aged 6 to 10 (the age range of children in the larger study) and incorporated data for calendar years 2005 and 2007 to capture conditions that lasted or were expected to last for at least 12 months.

Data access

The study was approved by Research Liaison staff of PopData, the Data Stewards at the British Columbia Ministry of Health, and the Ottawa Health Science Network Research Ethics Board, where the research was carried out. The encrypted data files were made accessible to the research team on a secure research environment (SRE) through PopData. Analysts accessed the SRE at the Ottawa Hospital Research Institute, an affiliated institute of the University of Ottawa.

Applying the CSHCN Screener

The CSHCN Screener tool[12] is a parent-reported measure used to identify children with special health care needs; it has been validated with survey data.[13,19-21] Five health consequences, which are not mutually exclusive, are assessed: 1) need for or use of medicine prescribed by a doctor (other than vitamins); 2) need for or use of more medical care, mental health care, or educational services than is usual for children of the same age; 3) being limited or unable to do the things most children of the same age can do; 4) need for or receipt of special therapy, such as physical, occupational, or speech therapy; and 5) emotional, developmental, or behavioural problem for which treatment or counselling is needed or received. A "yes" to any item (except 5) triggers two follow-up questions: whether the consequence is attributable to a medical, behavioural, or other health condition, and whether the condition has lasted or is expected to last for at least 12 months. The fifth item triggers only the latter question about duration.

Appendix Table A explains how each CSHCN Screener item was identified in the relevant administrative database. Only item 3 identified children based on specific diagnostic codes. The items were identified in the MSP administrative data by ensuring that 1) the specific health consequence was coded more than once (for example, two similar diagnostic codes), and 2) at least one of these codes appeared within the target 12-month period (with the second appearing within 6 to 18 months before or after the first code), which required inclusion of data from the previous (2005) and subsequent year (2007). If a specific health consequence was identified in the administrative data within the specified time frame, children were included in the *CSHCN* group; all others were grouped as *non-CSHCN*. Although the criteria are not mutually exclusive, this is in line with the original CSCHN Screener tool criteria. For example, although the same child can be captured by *each* of the five items, the final CSHCN group consisted of children captured by *any one* of the five items, thereby preventing double-counting.

Other measures for construct validation

Several individual- and community-level variables were used as construct checks on the coding of the five CSHCN Screener items. Because the prevalence of health problems is higher among boys than girls[22,23] and among older than younger children,[13,23] child sex and age, as indicated in the Consolidation File, were examined. It was predicted that the CSHCN Screener items would be more prevalent among boys and among older children. Children classified as having health problems tend to be hospitalized more often than healthy children[22]; therefore, overnight hospital admission, as indicated in the DAD, of the CSHCN and non-CSHCN groups was compared. Overnight hospital admissions in the DAD made it possible to access a data source other than the MSP to conduct construct checks on the coding of the CSHCN Screener items. Finally, socio-economic disadvantage has been associated with an increased risk of health problems.[13,24] Consequently, it was predicted that the receipt of premium subsidies and residence in lower-income neighbourhood quintiles, as indicated in the MSP and Consolidation File, respectively, would be higher in the CSHCN group, compared with the non-CSHCN group. Neighbourhood income quintiles are an aggregated socio-economic status indicator that divides the

provincial population into five income groups based on postal codes. PCCF+ software[25] was used to assign census geographies and income quintiles to MSP contract-holders.

Data analysis

Descriptive statistics were used to present the number and percentages of children identified for each CSHCN health consequence, including the three most common Anatomical Therapeutic Chemical (ATC) Classification groups that accounted for the highest percentages of prescribed drugs, medicines for which a prescription was filled, and recorded medical care service codes during the 2005-to-2007 period. Item prevalence was stratified by sex and age group. As an initial test of construct validity, rates of overnight hospital admissions, receipt of premium subsidies based on family income, and neighbourhood income quintiles were compared for children classified as CSHCN and those classified as non-CSHCN.

Results

Overall 17.5% (n = 40,840) of children were identified as meeting at least one of the five CSHCN Screener criteria; the majority—82.5% (n = 192,030)—did not meet any of the criteria (Table 1).

For item 1 of the CSHCN Screener (prescription medicine use), fewer than 1% of children (n = 1,602) were identified based on a 12-month cut-off (medicine use for 365 days of any 365-day period from 2005 to 2007). Based on a 9-month cut-off (medicine use 274 days or more), 3.3% of children (n = 7,596) were identified, and based on a 6-month cut-off (medicine use for 183 days or more), 5.6% of children (n = 13,036) were identified. The 9-month cut-off was used in this study (Table 1). The 6-month cut-off captured many medications used for acute rather than chronic conditions (for example, antiseptics and antibiotics), whereas the 12-month cut-off was considered too conservative, as it captured few respondents. To reinforce this decision, percentages of child hospital admissions by each medicine use cut-off were calculated—the percentages hospitalized were 6.5%, 8.4%, and 15.9% for the 6-, 9-, and 12-month cut-offs, respectively.

For children with 9 months of medicine use in any 12-month period from January 2005 to December 2007, the ATC groups that accounted for the highest percentages of prescribed drugs were: nervous system (48.5%; for example, psychostimulants), respiratory system (17.9%; for example, bronchodilators), and anti-infectives for systemic use (9.3%; for example, antibiotics). Methylphenidate (17.2%), Risperidone (6.1%), and Dexamfetamine (5.9%) were the top three medicines for which a prescription was filled.

For item 2 (medical care), the 95th percentile of the number of visits in 2006 was 14 for 6-year olds, 13 for 7- to 9-year-olds, and 12 for 10-year-olds. Based on these thresholds, 14% (n = 32,605) of children were identified as receiving more medical care than is usual for children the same age (Table 1). For children who received more medical care than usual, the three most commonly recorded service codes during the 2005-to-2007 period were regional examinations (52.2%), pathology (10.9%), and consultations (6.6%).

Based on the criteria for item 3 (functional limitations), 5.2% of children (n = 12,033) were identified. For item 4, very few children—0.1% (n = 179)—were identified as needing or receiving special therapy. For item 5, 1.9% (n = 4,324) were identified as needing or receiving treatment or counselling.

As expected, a higher percentage of boys than girls (19.3% versus 15.6%; $p < .0001$) were classified as CSHCN (Table 2). This was the case for each

Table 1
Prevalence of CSHCN (Children with Special Health Care Needs) items, population aged 6 to 10, British Columbia, 2005 to 2007

CSHCN item	%	Number
Any of items 1 to 5	17.5	40,840
Item 1 (medicine use)	3.3	7,596
Item 2 (more medical care use than usual)	14.0	32,605
Item 3 (functional limitations)	5.2	12,033
Item 4 (physical, occupational or speech therapy)	0.1	179
Item 5 (counselling)	1.9[†]	4,324

† inclusion of children who had a prescription filled for a drug categorized for the nervous system under the Anatomical Therapeutic Chemical (ATC) Classification System raised the percentage to 4.15%, but the final percentage identified as CSHCN by any of the five items did not change significantly (17.5% versus 18.1%)

Source: Population Data BC, 2005 to 2007.

Table 2
Prevalence of CSHCN (Children with Special Health Care Needs) items, by sex and age, population aged 6 to 10, British Columbia, 2005 to 2007

	Sex			Age					
CSHCN item	Girls (n = 113,411)	Boys (n = 119,457)	χ^2	6 (n = 43,699)	7 (n = 44,875)	8 (n = 46,240)	9 (n = 47,824)	10 (n = 50,232)	χ^2
Any of items 1 to 5	15.6	19.3	548.8*	18.7	17.4	20.0	16.5	18.2	109.7*
Item 1 (medicine use)	2.2	4.2	736.0*	2.4	2.8	3.3	3.7	4.0	234.7*
Item 2 (more medical care use than usual)	13.2	14.8	112.6*	16.4	14.4	13.1	12.4	14.0	348.3*
Item 3 (functional limitations)	3.5	6.7	1,227.0*	3.7	4.6	5.4	5.8	6.2	389.2*
Item 4 (physical, occupational or speech therapy)	0.1	0.1	1.0	0.1	0.1	0.1	0.1	0.1	5.0
Item 5 (counselling)	1.2	2.5	614.1*	1.3	1.7	2.0	2.1	2.2	126.5*

* $p < .0001$

Source: Population Data BC, 2005 to 2007.

Table 3
Prevalence of overnight hospitalization, by CSHCN (Children with Special Health Care Needs) item and CSHCN status, population aged 6 to 10, British Columbia, 2005 to 2007

	Overnight hospitalization				
	Yes		No		
CSHCN item and CSHCN status	%	Number	%	Number	χ^2
Any of items 1 to 5					5,365.5*
CSHCN	5.6	2,031	94.4	34,291	
Non-CSHCN	0.7	990	99.4	184,733	
Item 1 (medicine use)					2,718.2*
CSHCN	8.4	636	91.6	6,960	
Non-CSHCN	1.2	2,665	98.8	222,609	
Item 2 (more medical care use than usual)					6,646.6*
CSHCN	6.4	2,076	93.6	30,529	
Non-CSHCN	0.6	1,225	99.4	199,040	
Item 3 (functional limitations)					828.3*
CSHCN	4.4	534	95.6	11,499	
Non-CSHCN	1.3	2,767	98.8	218,070	
Item 4 (physical, occupational or speech therapy)					136.4*
CSHCN	11.7	21	88.3	158	
Non-CSHCN	1.4	3,280	98.6	229,411	
Item 5 (counselling)					1,018.0*
CSHCN	7.1	307	92.9	4,017	
Non-CSHCN	1.3	2,994	98.7	225,552	

* $p < .0001$

Source: Population Data BC, 2005 to 2007.

Table 4
Prevalence of premium subsidy receipt, by CSHCN (Children with Special Health Care Needs) item and CSHCN status, population aged 6 to 10, British Columbia, 2005 to 2007

	Premium subsidy receipt				
	Yes		No		
CSHCN item and CSHCN status	%	Number	%	Number	χ^2
Any of items 1 to 5					3,408.5*
CSHCN	35.3	12,812	64.7	23,510	
Non-CSHCN	21.2	41,597	78.8	154,951	
Item 1 (medicine use)					1,014.3*
CSHCN	38.6	2,930	61.4	4,666	
Non-CSHCN	22.9	51,479	77.2	173,795	
Item 2 (more medical care use than usual)					2,864.0*
CSHCN	35.0	11,410	65.0	21,195	
Non-CSHCN	21.5	42,999	78.5	157,266	
Item 3 (functional limitations)					1,807.1*
CSHCN	39.3	4,733	60.7	7,300	
Non-CSHCN	22.5	49,676	77.5	171,161	
Item 4 (physical, occupational or speech therapy)					237.3*
CSHCN	72.1	129	27.9	50	
Non-CSHCN	23.3	54,280	76.7	178,411	
Item 5 (counselling)					553.8*
CSHCN	38.4	1,659	61.6	2,665	
Non-CSHCN	23.1	52,750	76.9	175,796	

* $p < .0001$

Note: Eligibility for premium subsidy is based on net family income for the previous year.
Source: Population Data BC, 2005 to 2007.

item except 4 (special therapy), for which no difference emerged, possibly because of the small sample size ($n < 100$) in each gender group. A non-linear relationship was observed for age, with the highest percentage of children classified as CSHCN at age 8. As children got older, medicine use, functional limitations, and the use of counselling services increased ($p < 0.001$). However, medical care use (item 2) decreased at older ages ($p < 0.001$), and the sample size for needing or receiving special therapy (item 4) was too small ($n < 50$) for age comparisons.

The prevalence of overnight hospital admissions was higher among the CSHCN group (5.6%), compared with the non-CSHCN group (0.7%; $p < .0001$) (Table 3). This difference was statistically significant for each Screener item. In fact, 70% of children who were hospitalized overnight were identified as CSHCN.

Children in the CSHCN group were more likely than those in the non-CSHCN group to be in a family that received premium subsidies: 35.3% versus 21.2% ($p < .0001$) (Table 4). This pattern held for each CSHCN Screener item.

A higher percentage of children in the CSHCN group than in the non-CSHCN group lived in the lowest income quintile neighbourhoods; however, the difference was small: 21.2% versus 19.7% ($p < .0001$) (Table 5). This was also the case for Screener items 2 (medical care use) and 3 (functional limitations).

Discussion

This study applied the CSHCN Screener tool—a non-categorical measure typically used with survey data—to administrative information from Population Data BC in order to identify children with health problems, as reflected in health service use. The aim was to determine what can and cannot be captured in administrative health data. To support the results, demographic and socio-economic characteristics of children classified as

Table 5
Percentage distribution of neighbourhood income quintile, by CSHCN (Children with Special Health Care Needs) item and CSHCN status, population aged 6 to 10, British Columbia, 2005 to 2007

	Neighbourhood income quintile				
	Lowest		Mid-low to highest		
CSHCN item and CSHCN status	%	Number	%	Number	χ^2
Any of items 1 to 5					46.7*
CSHCN	21.2	7,604	78.8	28,224	
Non-CSHCN	19.7	37,966	80.4	155,204	
Item 1 (medicine use)					1.6
CSHCN	20.5	1,523	79.5	5,918	
Non-CSHCN	19.9	44,047	80.1	177,510	
Item 2 (more medical care use than usual)					55.7*
CSHCN	21.4	6,905	78.6	25,302	
Non-CSHCN	19.7	38,665	80.4	158,126	
Item 3 (functional limitations)					17.4*
CSHCN	21.4	2,527	78.6	9,285	
Non-CSHCN	19.8	43,043	80.2	174,143	
Item 4 (physical, occupational or speech therapy)					0.0
CSHCN	19.3	34	80.7	142	
Non-CSHCN	19.9	45,536	80.1	183,286	
Item 5 (counselling)					0.1
CSHCN	20.1	850	79.9	3,385	
Non-CSHCN	19.9	44,720	80.1	180,043	

* $p < .0001$

Source: Population Data BC, 2005 to 2007.

CSHCN and non-CSHCN were compared. Consistent with research based on survey data,[13,22,23,26] application of the CSHCN Screener to administrative data revealed a higher prevalence of health care consequences among boys and among children from economically disadvantaged families (receiving premium subsidies and living in the lowest income quintile neighbourhoods). Children classified as CSHCN were also more likely to have been hospitalized.

According to this application of the Screener tool, 17.5% of children in the administrative data were identified as CSHCN. However, this study was limited to 6- to 10-year-olds in British Columbia. Health service use may be different for other ages and would likely differ by province. As well, the survey- or interview-based Screener covers both health care needs and health service use, but administrative data, by nature, capture only health service use. Nonetheless, the overall estimate is in line with American and Canadian surveys that identified 15% to 20% of children aged 0 to 17 as CSHCN.[13,19,26]

For the medicine use item (1), this approach yielded 3.3% of children, which is considerably below other estimates. For example, using Canadian Health Measures Survey (CHMS) data for 2007 to 2009, Kuhle et al.[27] reported that 11% of 6- to 11-year-olds in British Columbia had taken medications (prescription and non-prescription drugs and natural health products) in the last month. More recently, based on 2007 to 2009 and 2009 to 2011 data from the same survey, Rotermann et al.[28] found that 12% of 6- to 14-year-olds had taken prescription medication in the last two days. Different definitions of item 1, such as counting days with two prescriptions filled as two days rather than one, and examining prescription drug use within a single 3-level ATC group, did not change the percentage of children identified in the administrative data by more than one percentage point. The lower prevalence in the present analysis may be because the study population was younger (ages 6 to 10) than those on which other estimates were based (ages 6 to 11 and 6 to 14), and because drug use was restricted to prescription medicines. Perhaps more important, the measure used here required continuity of prescription medicine use for at least nine months during a twelve-month period, as opposed to any medicine use, including prescription and non-prescription drugs and natural health products, in the last month or last two days.

For special therapy (item 4) and counselling (item 5), the percentages were lower than reported by survey-based studies.[13,14,19,22] This may be due to lack of access to services and/or differences in data sources (medical claims versus population surveys). In particular, special therapy and counselling services are not covered by MSP, and

What is already known on this subject?

- Studies using administrative health data to study child populations have focused on measures of pediatric health service use or on the prevalence of specific conditions.
- Defining child health in terms of specific conditions does not reflect current theoretical and conceptual frameworks.

What does this study add?

- This study assesses the application of the Children with Special Health Care Needs (CSHCN) Screener to Canadian administrative health data.
- Administrative data can provide useful information for non-categorical definitions of child health.
- Limitations emerged in the identification of activity restrictions, use of special therapies, and counselling for emotional and behavioural problems. In addition, health care needs, severity of the condition, and quality of life are not captured in administrative data.

so are under-reported in administrative data. In addition, MSP data pertain to services provided by physicians such as psychiatrists, but services provided by community and school-based professionals (for instance, speech therapists, specialized educators, and counselors) are not captured. And although the prevalence was comparable to those in other studies,[13,21,22] administrative data do not fully capture functional limitations and social participation.

Results for overnight hospital admissions, demographic, and community characteristics for each CSHCN Screener item were generally in the expected direction. For example, for most items, the percentage of boys was higher than the percentage of girls; the exception was special therapy (item 4), which may be due to small sample size. The results for age were mixed. The percentages for medicine use (item 1), functional limitations (item 3), and counselling (item 5) were higher for older than for younger children, but not for more medical care use (item 2) and special therapy (item 4). While this suggests that not all consequences increase with age, it may be that older children receive services not covered by the MSP, and so are not reflected in the administrative data. These findings warrant further research on factors that may influence children's access to health services.

As expected, and consistent with the literature,[22,29] the prevalence of overnight hospital admissions was higher for the CSHCN group and for each item. Also consistent with previous findings,[13,30] a higher percentage of the CSHCN group were in families that received a premium subsidy; this held for each item.

This pattern was not replicated with the neighbourhood income variable. Although those in the CSHCN group who lived in neighbourhoods in the lowest income quintile had more medical care use and more functional limitations, the differences were not statistically significant for medicine use, special therapy, and counselling. The lack of neighbourhood differences may indicate equal medicine use or equal access, regardless of neighbourhood. Future research could evaluate potential biases (for example, those with limited access to health services) in these findings. For the special therapy and counselling items, the lack of neighbourhood differences may be due to the relatively small sample sizes (especially for special therapy: $n < 50$) or similar access to such services across neighbourhoods. Future research into children's access to specialized health and mental health services could examine other neighbourhood characteristics, such as distance to services, hospitals[31] and health care practitioners.

The findings of this analysis should be interpreted with some caution. For instance, the CSHCN Screener items used to assess functional limitations and the use of special therapies and counselling services may not be well-recorded in provincial administrative data. In addition, access to services, quality of life, and the severity of the health condition are not captured by the CSHCN Screener or in administrative data.

Conclusion

This study applied a non-categorical measure of child health, the CSHCN Screener, to province-wide administrative data. The availability of administrative data offers previously unexplored research opportunities in the area of child health. As a measure of service use, the CSHCN Screener may offer a non-categorical approach to identifying such children in administrative health data. ■

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Appendix

Table A
Application of CSHCN Screener items to administrative health data

	CSHCN Screener item	Application of item
1.	Does your child currently need or use medicine prescribed by a doctor (other than vitamins)?	Data for this item came from the PharmaNet data file.[18] A day of medicine use was defined based on the date the prescription was filled and the number of days of medication supplied. A child can have more than one prescription filled on the same day, with different numbers of days supplied for each. Even if prescription dates differed, the days supplied might overlap. It was assumed that the child starts the prescription the day it is filled. A cautionary note is that days of medication prescribed do not necessarily equal to days of medication taken. Three cut-off options were examined: 6 (≥ 183 days), 9 (≥ 274 days), and 12 months (≥ 365 days) of medicine use in any 12-month (365 days) period from January 2005 to December 2007. The three most commonly used prescription drugs were identified. The Anatomical Therapeutic Chemical (ATC) Classification System was used to classify drugs according to the organ or system on which they act and/or their therapeutic and chemical characteristics.[32]
2.	Does your child need or use more medical care, mental health, or educational services than is usual for most children of the same age?	Data for this item are from the MSP data file.[33] Each unique service date and specialty code for each individual was considered a separate visit. Codes indicating the type of services rendered by a practitioner were counted for each child. The data contained 45 active service codes, for example, regional examinations. (The list is available from the authors.) The age-specific 95th percentile for the number of visits in 2006 was used as a cut-off to identify children who had more than the usual number of medical service visits for children their age.
3.	Is your child limited or prevented in any way in his or her ability to do the things most children of the same age can do?	The data source was the MSP data file.[33] Diagnostic codes from the International Classification of Diseases, Ninth version (ICD-9) were used to identify the condition for which the individual was treated. Two sets of specific diagnostic codes were considered to indicate the presence of functional limitations for which the child was treated: (a) indicators of "disability among youth,"[34] using data from the Population Health Research Data Repository at the Manitoba Centre for Health Policy, and (b) a list of the most common ICD-10 codes (converted to ICD-9) for Canadian children with neurologically-based functional limitations/disabilities identified in the 2006 Participation and Activity Limitation Survey dataset.[35] The final list of diagnostic codes included: epilepsy, hydrocephalus, spina bifida, developmental delay, hearing loss, cystic fibrosis, emotional problems, cerebral palsy, blindness, motor, speech-language, learning-cognition, social, sensory, and psychological domains. (The complete list is available from the authors.) Children who had one of these diagnostic codes in 2006 and the same code within the following or previous 6- to 18-month period met the criteria for this item.
4.	Does your child need or receive special therapy, such as physical, occupational, or speech therapy?	The data source was the MSP data file.[33] Four specialty codes were used: physical medicine and rehabilitation specialist, physical therapist, occupational therapist, and respiratory therapist. These codes describe a practitioner's specialty associated with a claim, assigned when the claim was processed. Children who had one of these codes in 2006 and the same code within the following or previous 6- to 18-month period met the criteria for this item.
5.	Does your child have any kind of emotional, developmental, or behavioral problem for which he or she needs or receives treatment or counselling?	The data source was the MSP data file.[33] Specialty and service codes were used. Specialty codes included psychiatrist and counselor/psychologist. Service codes included counselling and counselling psychotherapy. Children who had one of these diagnostic codes in 2006 and the same code within the following or previous 6- to 18-month period met the criteria for this item.